



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,082	05/12/2006	Marc Charles Berckmans	19790-009US1	6371
26191 7590 02/16/2011 FISH & RICHARDSON P.C. (TC) PO BOX 1022 MINNEAPOLIS, MN 55440-1022				
EXAMINER				
DEGUIRE, KATHERINE E				
ART UNIT		PAPER NUMBER		
1781				
NOTIFICATION DATE		DELIVERY MODE		
02/16/2011		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Office Action Summary

Application No.

10/579,082

Applicant(s)

BERCKMANS ET AL

Examiner

Katherine DeGuire

Art Unit

1781

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16, 20 and 22-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16, 20, 22-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-945)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/15/2010 has been entered.

Claim Rejections - 35 USC § 103

Claims 1-16,20,23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Idaszak (US #4,021,927) in view of Vezzani (EP 0710670 A1,).

Regarding claim 1, Idaszak discloses a method for modifying starch or starch derivatives (column 3, lines 47-50) comprising:

- a. Introducing a continuous flow of starch substrate, gas, (column 3, lines 57-65) and optionally, one or more reagents (column 5, lines 35-45), into a reactor,
- b. Wherein the starch substrate has a moisture content between 10-12% by weight (column 4, lines 10-20)
- c. A residence time in the reactor of less than 1 hour and is heated to between 125 and 380° F (column 8, lines 10-20),
- d. Characterized in that the starch substrate and the gas are introduced into the reactor in opposing directions (column 3, lines 47-65 disclose that this preferably occurs counter-currently)

- e. An agitator means in the upper and lower chamber in the form of multi-bladed upthrust impellers to convey the starch from the inlet to the outlet(column 5, line

Idaszak fails to disclose that the reactor contains a cylindrical body. However, Vezzani discloses a method of modifying starches in a cylindrical reactor, wherein the reactor contains a bladed rotor which conveys the starch substrate from the inlet of the reactor to the outlet (column 2, lines 1-30). Vezzani teaches that the reactor has a cylindrical tubular design thus demonstrating that it is conceivable for a reactor to be both cylindrical and tubular internally(column 2, line 1-6). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the reactor of Idaszak to have a cylindrical tubular design in order to convey the starch from the inlet of the reactor to the outlet as disclosed in Vezzani because the reactor design combined with the agitation applied by a rotor within the reactor favors the completion of the modification reaction (column 2, lines 39-43).

Regarding claims 2, 20, Idaszak and Vezzani disclose the method according to claim 1. Based on the diameter of the reactor tubes of Idaszak (column 13, table) and the rpm range of 300-1500 rpm disclosed in Vezzani (column 2, lines 5-10), the tip speed of a blade in the method according to Idaszak and Vezzani will be between 1-5 m/s.

Regarding claim 3, Idaszak teaches that the starch has 10-12% moisture (column 4, lines 10-20)

Regarding claim 4, Idaszak teaches that the starch is a native starch or a starch derivative (column 7, lines 45-55).

Regarding claim 5, Idaszak and Vezzani disclose the method of claim 1 but fail to explicitly disclose that the starches are added to the reactor in powdered form. However, Idaszak discloses that the starches introduced to the reactor are starches such as cornstarch and potato starch (column 7, lines 45-55). These starches are well known in the art to generally come in powdered form. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to add starch to the reactor in a powdered form, since starches like the ones used in Idaszak are well known to come in powdered form, and there is no suggestion to use the starch in another form. In other words, if one having ordinary skill in the art at the time of the invention were to practice the invention of Idaszak absent instruction to change the form of the starch to one other than a powder, they would have used starches like cornstarch or potato starch in powdered form, because the art accepted definition of these starches provides for them being in powdered form.

Regarding claims 6-7, the reagent disclosed is an acid (column 5, lines 35-45), specifically hydrochloric acid, which is a mineral acid.

Regarding claim 8, the reagents are added in an amount between 0.001 to 0.10 by weight (column 8, lines 1-7).

Regarding claim 9, it is disclosed that the hydrochloric acid may be added as a gas (example 1).

Regarding claim 10, the acid is added to the starch prior to being added to the reactor (column 7, lines 55-60).

Regarding claim 11, the residence time is disclosed to frequently range from 10-30 minutes (column 8, lines 15-17).

Regarding claim 12, the temperature of the reactor is disclosed to be within a temperature range of 125-380° F (column 8, lines 12-15).

Regarding claim 13, the gas introduced to the reactor can be air, steam, or nitrogen (column 8, lines 27-32)

Regarding claim 14, 24, 25, Idaszak discloses a method for preparing a highly soluble starch comprising introducing a continuous flow of starch substrate, gas and a mineral acid into a reactor (column 3, lines 57-65, column 5, lines 35-45, example 1), wherein the starch substrate has a moisture content between 10 and 12% by weight (column 4, lines 15-20), a residence time in the reactor of between 10 and 30 minutes and is heated to between 170 and 375° C (column 8, lines 12-17), characterized in that the starch substrate and the gas are introduced into the reactor in opposing directions (column 3, lines 47-65 disclose that this preferably occurs counter-currently). Idaszak further teaches an agitator means in the upper and lower chamber in the form of multi-bladed upthrust impellers to convey the starch from the inlet to the outlet.

Idaszak fails to disclose that the reactor contains a cylindrical body. However, Vezzani discloses a method of modify starches in a cylindrical reactor, wherein the reactor contains a bladed rotor which conveys the starch substrate from the inlet of the reactor to the outlet (column 2, lines 1-30). It would have been obvious to one having

ordinary skill in the art at the time of the invention to modify the reactor of Idaszak to contain a cylindrical body because the cylindrical body reactor favors the completion of the modification reaction (column 2, lines 39-43).

Regarding claim 15, Idaszak discloses the method of claim 14, but fails to explicitly disclose that the reaction occurs under alkaline conditions. However, Idaszak discloses that adjusting the pH (the alkalinity or acidity) of the reaction conditions can allow practitioners of the invention to choose if a certain agent will bleach or oxidize a starch. Therefore it would have been obvious to one having ordinary skill in the art to adjust the alkalinity of the reaction conditions for the intended application, since it has been held that determining the optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 16, the highly soluble starch is 94.5% soluble in 25° C water (example 1, test #4050).

Regarding claim 24, Idaszak teaches a jacket which serves to provide heat to the reactor walls and subsequently to the starch particles (identified as 32 on figures 1 and 2, column 6, line 27-40).

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Idaszak (US #4,021,927) in view of Vezzani (EP 0710670 A1) further in view of Ferguson(US 5766366).

Regarding claim 22, Idaszak and Vezzani do not specifically teach that the starch substrate is conveyed from the inlet to the outlet in a continuous, plug-flow type

manner. However, Ferguson teaches a method of hydrolyzing starch in which the starch is conveyed from the inlet to the outlet in a continuous, plug-flow reactor.

Ferguson teaches that the advantage of plug flow reactors is that the retention time can be held substantially identical for all the starch being produced. This allows for uniformity and greater ease in automation of the process(column 3, line 54-60). Thus, it would have been obvious to modify Idaszak and Vezzani with Ferguson by using a plug flow reactor in order to achieve uniformity with starch flow and starch retention time.

Response to Arguments

Applicant's arguments filed 12/15/2010 have been fully considered but they are not persuasive.

The applicant argues that Vezzani does not teach the claimed time and temperature of the turbo reactor and the concept that the flow of air and the flow of starch are in different directions. While Vezzani does not teach these limitations, the primary reference Idaszak clearly does.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The applicant further argues that Vezzani teaches a batch reactor and considers the continuously operated tank reactor as described in Idaszak as unsuitable for modification of starch on an industrial scale. However, the section that the applicant relies upon (column 1, line 33-38) to support this statement is in the background section and describes the state of the prior art. In the next paragraph, Vezzani teaches that the batch reactor produces an enormous amount of aqueous reflux and is this disadvantageous. Vezzani further states that the batch method is discontinuous and has adverse effect on the control and on the overall economy of the method. (column 1, line 39-49). The invention of Vezzani actually teaches supplying a continuous flow of starch and continuous agitation of the starch in order to favor the completion of the reaction (column 2, line 1-6 and line 39-43). Thus, Vezzani and Idaszak both teach a continuous flow of starch and teach away from a batch reactor system.

The arguments pertaining to the plug-flow reactor are moot in view of the new ground of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine DeGuire whose telephone number is (571)270-1136. The examiner can normally be reached on Monday through Friday 9-5:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Keith Hendricks can be reached on 571-272-1401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Katherine DeGuire/
Examiner, Art Unit 1781

/Lien T Tran/

Primary Examiner, Art Unit 1789